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10/781,363	02/18/2004	Steven Holdcroft	2269.027US1	2768

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SCHWEGMAN, LUNDBERG & WOESSNER, P.A.  
P.O. BOX 2938  
MINNEAPOLIS, MN 55402

EXAMINER
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CANTELMO, GREGG

ART UNIT	PAPER NUMBER
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1745

MAIL DATE	DELIVERY MODE
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08/31/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/781,363	<b>Applicant(s)</b> HOLDCROFT ET AL.	
	<b>Examiner</b> Gregg Cantelmo	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 14-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Response to Amendment***

1. In response to the amendment received May 16, 2007: claims 29-34 have been cancelled as per Applicant's request.

***Election/Restrictions***

2. Applicant's election without traverse of Group I, claims 1-28 in the reply filed on May 16, 2007 is acknowledged. Applicant's election with traverse of the species requirement in the reply filed on May 16, 2007 is acknowledged. Applicant's election with traverse of the species requirement in the reply filed on May 16, 2007 is acknowledged, but is not persuasive. While Applicant argues that claim 1 is generic to claim 14, this argument is not persuasive. First the claim 1 is not generic since claim 1 does not require a monomer/solvent combination which is requisite to claim 14. Thus the invention of claim 1 need not have any solvent, let alone a polar solvent, for dissolving the monomer of claim 1 and thus is not generic to claim 14. Furthermore the specification teaches of these two embodiments being alternative embodiments (see paragraph 26) and by being described as alternative embodiments, are not held to be directed to a generic claim and species claim as argued. Thus the species requirement stands since the inventions are described as alternative embodiments. Applicant is advised to correct the status identifiers of claims 14-28 to reflect the appropriate status of these claims. Action on the merits of claims 1-13 is set forth herein.

***Priority***

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3. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c) is acknowledged.

***Information Disclosure Statement***

4. No IDS appears to have been filed with the application prior to this office action. If Applicant is aware of any pertinent prior art relating to the disclosed and claimed invention, Applicant is invited to submit them for consideration and in accordance with 37 § CFR 1.56.

***Drawings***

5. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

6. The disclosure is objected to because of the following informalities:
- a. The claim to priority must be in the first sentence of the application;
  - b. The specification recites the term "elastising agent" which is not understood. It might be that the term is meant to be "elasticizing agent";
  - c. The term "acrylonitril" is misspelled in paragraph 74 of the specification;

- d. The term "protonic monomer" is not exemplified and thus is not clear as to what monomers were appreciated as being the requisite "protonic monomer" (see paragraph 73 as an example);
- e. The specification employs both the terms "phosphonic acid" and "phosphoric acid". These acids are distinct from one another yet appears to be interchangeably used in the instant application. For example while the monomer is first said to be a material including phosphonic acid (para. 28), at least one example uses phosphoric acid (para. 79). Applicant is advised to review the specification for consistency in the use of terms for the various groups described throughout the specification.
- f. The mixture of materials recited in paragraph 73 is not particularly clear. The example recites a vinyl monomer mixture including an unspecified protonic monomer (held to be nondescript), a vinyl "phosphoric" acid, a cross-linking agent and a divinyl sulfone. One of ordinary skill in the art would consider divinyl sulfone itself would appear to be an exemplary cross-linking agent in this combination. Thus the mixture would appear to include plural cross-linking agents in the absence of any clear teaching of this prior to. The examiner requests clarification to at least this example as to the actual nature of the vinyl monomer mixture.

In light of the plural specification objections above, applicant is advised to review the entire specification for any additional grammatical errors. Appropriate correction is required.

***Claim Objections***

7. Claims 1-13 are objected to because of the following informalities: the claims recite both "cross linking" and "cross-linking" and it is suggested that the term be selected to be either of these descriptions and not both. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for particular electrolyte compositions described in the specification, does not reasonably provide enablement for the breadth of electrolyte compositions recited in the significantly broader claims. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The ranges of materials and significantly broader genus of materials recited in the claims are held to be significantly broader than that to which the written description is entitled to claim. As discussed below, the ranges of materials is particularly broad and, at points indefinite, due to the broad scope of wt% that the claims encompass. In addition, the claims recite genus of materials which are also significantly broader than that which the written description reasonably encompasses. In light of these issues, and in light of the broader scope of the claimed subject matter, it would require undue experimentation to

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ascertain those compositions which were appreciated by applicant at the time the claimed invention was made. Thus the claimed subject matter does not comply with 35 U.S.S. 112, first paragraph.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. The claims recite weight percentages wherein all combinations of the claimed weight percentages fail to add up to 100 wt%, particularly for the limits of each claimed range. Thus while the claims do define a 100 wt% for 89 wt% of the monomer, 10 wt% of the PFSI and 1 wt% of the cross-linking agent, the mixture fails to define a 100 wt% monomer for the combination of the lower limits of each range, 10 wt% PFSI, 10 wt% monomer and 1 wt% cross-linking agent (total wt% therein is only 21 wt% and thus 79 wt% is unaccounted for).

Additionally the ranges includes combinations which are in excess of 100 wt%, for example 50 wt% PFSI, 89 wt% monomer and 60 wt% cross-linking agent renders a total wt% of 199 wt%. Thus the claimed ranges which include combinations which vastly exceed or fall significantly short of 100wt% and fail to account for these combinations, fail to clearly define the electrolyte composition and is held to be indefinite. As to the dependent claims, they neither remedy this issue nor in some instances further render the claimed weight percentages

indefinite upon the inclusion of additional materials to the mixture, such as initiators (see claim 2). The presence of additional materials in the dependent claims would impact the previously claimed weight percentages. For example, adding 5-10wt% initiator to the claims would impact the lower limits of the claimed elements in the independent claims by reducing the weight percentages below the limit set forth in the independent claims. For example, in claim 1 if the PFSI in the combination of claim 1 is 10wt% in some of the combinations, this percentage would be reduced below 10wt% with respect to the addition of the claimed initiator since the initiator would add to the total weight percentage of the composition and thus reduce the previously claimed weight percentages of the initial materials of the independent claim. Applicant is required to review the claims and disclosure and clearly define the compositional makeup of the claimed electrolyte composition.

b. Claim 11 recites the term "elastising agent" which is not understood. It might be that the term is meant to be "elasticizing agent";

c. Claim 12 recites the limitation "the elasticizing agent" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. Claim 1 to which claim 12 is directly dependent, recites an elasticizing agent prior to the recitation and thus there is no clear antecedent basis for this term. It might be that claim 12 should be dependent upon claim 11 if the term "elastising" of claim 11 is in fact intended to be "elasticizing".

### ***Double Patenting***



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10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1-13 are provisionally rejected on the ground of nonstatutory

obviousness-type double patenting as being unpatentable over claims 1-13 of

copending Application No. 10/780,968. Although the conflicting claims are not identical, they are not patentably distinct from each other.

Copending Application No. 10/780,968 claims:

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What is claimed is:

1. An electrochemical cell comprising a curable perfluoro-sulfonate ionomer based electrolyte composition, wherein the electrolyte composition comprises:

- a. between 10 wt % and 50 wt % of a perfluoro-sulfonate ionomer (PFSI) comprising acidic groups for transporting protons;
- b. between 10 wt % and 89 wt % of a monomer for dissolving the PFSI;
- c. between 1 wt % and 60 wt % of a cross linking agent having at least two vinyl functionalities; and
- d. wherein upon combining the PFSI, monomer and cross linking agent, a curable electrolyte solution is formed with at least 50 wt % of the above components based on the total weight percent of the formed solution.

2. The electrochemical cell of claim 1, further comprising a quantity of initiator sufficient to cure the composition when using a procedure comprising of photo-curing, thermal curing and combinations thereof.

3. The electrochemical cell of claim 1, wherein the PFSI comprises acid groups.

4. The electrochemical cell of claim 1, wherein the monomer is a vinyl monomer bearing an acidic group.

5. The electrochemical cell of claim 4, wherein the acidic group comprises a sulfonic acid group, a phosphonic acid group, a carboxylic acid group, and combinations thereof.

6. The electrochemical cell of claim 1, wherein the cross-linking agent vinyl functionalities are divinyl derivatives of an organic compound.

7. The electrochemical cell of claim 6, wherein the organic compound is selected from the group consisting of an aliphatic, an aromatic, a heteroaromatic and combinations thereof.

8. The electrochemical cell of claim 6, wherein the organic compound is selected from the group consisting of sulfonic acid, sulfones, phosphates, phosphones, phosphonic acid, carboxylates, carboxylic acid, acrylates, methacrylates, acrylamides, methacrylamides, and combinations thereof.

9. The electrochemical cell of claim 1, wherein the cross linking agent vinyl functionality is a trivinyl derivative of an organic compound.

10. The electrochemical cell of claim 9, wherein the organic compound is selected from the group consisting of sulfonic acid, sulfones, phosphates, phosphones, phosphonic acid, carboxylates, carboxylic acid, acrylates, methacrylates, acrylamides, methacrylamides, and combinations thereof.

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11. The electrochemical cell of claim 1, wherein the curable liquid electrolyte solution further comprises an elastifying agent.

12. The electrochemical cell of claim 1, wherein the elasticizing agent is a polymerizable vinyl monomer to enhance the toughness of structure of the cured electrolyte.

13. The electrochemical cell of claim 1, consisting of:

- a. between 20 wt % and 40 wt % of a PFSI comprising acidic groups for transporting protons;
- b. between 20 wt % and 70 wt % of a monomer for dissolving the PFSI; and
- c. between 5 wt % and 50 wt % of a cross linking agent having at least two vinyl functionalities.

The difference between the instant claim and copending Application No.

10/780,968 is that the instant claims generically recite a protonic polymer. Copending Application No. 10/780,968 claims a particular protonic polymer, which is PFSI and thus is a particular species of the genus of protonic polymer of the instant claims. Thus the claims of the copending application anticipate the broader claims of the instant application and reasonably raise a double patenting issue.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 102/103***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1 and 3--13 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Application Publication No. 2005/0147859 (Kiefer).

Kiefer discloses a polymer electrolyte comprising a protonic polymer comprising acid groups, a vinyl phosphonic acid monomer and a cross-linking agent which includes a multiplicity of materials having at least two functionalities (abstract, examples and paragraph 139).

While the amounts of the constituents above are not clearly disclosed, pending a translation of this reference, it is noted that the claims are drawn to a product-by-process and that the end product of JP '291 and that of the instant claims which are identical in compositional elements will either inherently result in the same claimed product, else any differences would have been obvious to one of ordinary skill in the art to control the degree of crosslinking and ionic conductivity of the resultant electrolyte membrane.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of

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prima facie obviousness for product-by-process claims because of their peculiar nature” than when a product is claimed in the conventional fashion. In *re Fessmann*, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In *re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113 (as applied to claims 1 and 13).

The protonic polymer comprises acid groups (paragraph 99 as applied to claim 3).

The vinyl monomer includes phosphonic acid (abstract as applied to claims 4 and 5).

The cross-linking agent includes various functionalities including carboxylic acids, carboxylates, acrylates, methacrylates, etc. and includes trivinyl compositions as well (para. 139 as applied to claims 6-10).

As discussed above, the combination suggests using vinyl monomer constituents in the mixture. The claimed elasticizing compound is a vinyl monomer.

Since the teachings of Kiefer and Singleton suggest using vinyl monomers in the mixture and since these vinyl monomers are generically the same as the claimed and unspecified vinyl monomer of claims 11 and 12, there is a reasonable expectation that

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the combination above already having a vinyl monomer present in the mixture will function as the claimed elasticizing element absent clear evidence to the contrary.

Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application the basis for expectation of inherency is that Kiefer already employs a vinyl monomer and said vinyl monomer being the same as the generically claimed and generically disclosed vinyl monomer will provide some degree of elasticity and strength as recited in claims 11 and 12.

The Examiner requires applicant to provide that that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to

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product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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15. Claims 1, 3 and 6-8 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 53-029291 (JP '291).

JP '291 discloses a perfluorocarbon polymer having sulfonic acid groups (e.g. a PFSI) which is mixed with at least one monomer and a divinyl benzene crosslinking agent (abstract as applied to claim 1).

While the amounts of the constituents above are not clearly disclosed, pending a translation of this reference, it is noted that the claims are drawn to a product-by-process and that the end product of JP '291 and that of the instant claims which are identical in compositional elements will either inherently result in the same claimed product, else any differences would have been obvious to one of ordinary skill in the art.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to



come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

The PFSI above comprises sulfonic acid groups (abstract as applied to claim 3).

The cross-linking agent is divinyl benzene (as applied to claims 6-8).

***Claim Rejections - 35 USC § 103***

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Kiefer or JP '291 as applied to claim 1 above, and further in view of U.S. Patent No. 5,425,687 (Singleton).

The difference between claim 2 and either JP '291 or Kiefer is that neither JP '291 nor Kiefer clearly requires the presence of an initiator.

Singleton is drawn to cross-linking of various ion exchange membranes wherein the mixture includes a cross-linker such as divinyl benzene (col. 5, ll. 35-40). The mixture further can include an initiator (paragraph bridging columns 5 and 6).

The motivation for using an initiator would have been readily apparent to the ordinary worker in the art so as to initiate the cross-linking.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of either JP '291 or Kiefer by using an initiator since it would have provided the predictable result of initiating cross-linking. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v.*

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Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945) See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07. In addition the presence of the initiator is requisite in the process and is not clearly a component in the claimed product recited in the product-by-process claims. Thus absent clear evidence to the contrary, the initiator is not necessarily held to further limit the end product since it only serves to initiate polymerization and is not shown to materially impact the claimed composition.

17. Claims 4-5 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '291 as applied to claim 1 above, and further in view of U.S. Patent No.

865  
5,425,087 (Singleton) and U.S. Patent Application Publication No. 2005/0147859 (Kiefer).

The differences between claims 4 and 5 and JP '291 are that JP '291 does not clearly require the presence of a vinyl monomer bearing an acidic group (claim 4) or of particular acid groups (claim 5) or of an elasticizing vinyl monomer agent (claims 11-12). As to claims 4-5:

Singleton is drawn to cross-linking of various ion exchange membranes wherein the mixture includes a cross-linker such as divinyl benzene (col. 5, ll. 35-40). The mixture further includes the presence of vinyl monomer in the mixture (col. 4, ll. 36-62).

Kiefer teaches of the desire to mix a proton conducting polymer with vinyl-containing phosphonic acids (abstract) to obtain a membrane having outstanding chemical and thermal properties.

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The motivation for using an acid modified vinyl monomer would have been readily apparent to the ordinary worker in the art so as improve the cross-linking of the mixture and obtain a membrane having outstanding chemical and thermal properties.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '291 by selecting the monomer to be a vinyl-containing phosphonic acid monomer as taught by Singleton and Kiefer since it would have improved the cross-linking of the mixture and obtained a membrane having outstanding chemical and thermal properties. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

The motivation for using a vinyl acidic monomer would have been readily apparent to the ordinary worker in the art so as improve both the cross-linking of the mixture as well as the proton conductivity of the electrolyte membrane.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '291 by using an initiator since it would have provided the predictable result of improving cross-linking of the mixture. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

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As to claims 11 and 12:

As discussed above, the combination suggests using vinyl monomer constituents in the mixture. The claimed elasticizing compound is a vinyl monomer.

Since the teachings of Kiefer and Singleton suggest using vinyl monomers in the mixture and since these vinyl monomers are generically the same as the claimed and unspecified vinyl monomer of claims 11 and 12, there is a reasonable expectation that the combination above already having a vinyl monomer present in the mixture will function as the claimed elasticizing element absent clear evidence to the contrary. Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection.

The fact that a certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic. In re Rijckaert, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)

In the case of the instant application the basis for expectation of inherency is that the prior art combination, already employs a vinyl monomer and said vinyl monomer

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being the same as the generically claimed and generically disclosed vinyl monomer will provide some degree of elasticity and strength as recited in claims 11 and 12.

The Examiner requires applicant to provide that that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product.

Whether the rejection is based on inherency' under 35 U.S.C. 102, on prima facie obviousness' under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same...[footnote omitted]." The burden of proof is similar to that required with respect to product-by-process claims. In re Fitzgerald, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980) (quoting In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977)).

18. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP '291 as applied to claim 1 above, and further in view of Singleton and either U.S. Patent No. 4,166,014 (Sata).

Singleton is drawn to cross-linking of various ion exchange membranes wherein the mixture includes a cross-linker such as divinyl benzene (col. 5, ll. 35-40). The mixture further can include an initiator (paragraph bridging columns 5 and 6).

The motivation for using an initiator would have been readily apparent to the ordinary worker in the art so as to initiate the cross-linking.

In addition the use of both divinyl benzene and trivinyl benzene cross-linking agents is well known in the art as shown by Sata (paragraph bridging columns 4 and 5) and

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Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of JP '291 by using an initiator since it would have provided the predictable result of initiating cross-linking. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960). MPEP § 2144.07.

### ***Conclusion***

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. JP 2003-082012 A discloses a polymer electrolyte wherein a polyfunctional monomer is cross-linked with a proton conducting polymer.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is 571-272-1283. The examiner can normally be reached on Monday to Thursday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to read 'Gregg Cantelmo', with a stylized flourish at the end.

gc  
August 23, 2007

Gregg Cantelmo  
Primary Examiner  
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